



# Austin Energy Preliminary Distribution Design Tables

See the Design Criteria Manual for information on Network or Transmission Criteria

August 23, 2021, Revision 1.2

## **Working with Austin Energy (AE) Design**

Austin Energy's mission is to "Safely Deliver Clean, Affordable, Reliable Energy, and Excellent Customer Service." The AE Design team accomplishes this mission by designing according to our standard documents (AE Design Criteria Manual (DCM), AE Distribution Construction Standards (DCS), and AE Distribution Designer Guidelines (DDG)). Adhering to our standards will:

- Keep the public and our AE employees safe
- Improve the the customer experience throughout the Distribution Design Process
- Reduce the overall cost to the customer
- Maintain system reliability and service quality

## **Purpose of the Preliminary Distribution Design Tables**

The Preliminary Distribution Design Tables combine information referenced in the DCM, DCS, and DDG standards and present the information in a concise Table format for our customer's use (the most recent revisions of the DCM/DCS/DDG take precedence over any information shown on these sheets). Customers should review the material on these sheets before starting their project in order to avoid delays during the Site Plan Review, AE Design Intake, and Design processes. **The Preliminary Distribution Design Tables, like the Design Criteria Manual, do not attempt to cover all the situations that might be encountered, required, or requested concerning the construction/installation of an electric service. Specific design requirements and final approval of any installation must be coordinated directly with AE Distribution Design.**

## **11 Keys AE Distribution Design Needs Customers to Know Up Front**

1. AE Design enforces clearance and access requirements for employee and public safety (DCM 1.1.0)
2. Avoid delays by eliminating communication to AE Design from anyone other than your project single point of contact (SPOC). The SPOC can be changed throughout the project, but AE Design must be notified of each change.
3. AE must be able to access all AE infrastructure (DCM 1.3.15). See AE Truck Access section on Page 3.
4. The customer must adhere to OSHA clearances and ensure their building is constructable (DCM 1.5.2.12). AE may not be able to de-energize or cover-up overhead lines for customer construction or maintenance.
5. For underground service, AE requires the Customer to install all civil work for the AE facilities installed on the Customer's property (DCM 1.3.13).
6. It is the customers' responsibility to update AE Design with revisions to all their submitted documents (DCM 1.4.2.6). Failure to update AE Design leads to project delays.
7. To avoid coordination delays, contact AE Design when determining trench assignments with other utilities (i.e., Austin Water).
8. When required, submit AutoCAD files that meet AE requirements (DCM 1.4.2.6 & 1.14.2.1). See Page 2.
9. Developers looking to remove overhead power line poles that also have communication lines attached must also contact Austin Energy's Pole Attachment Services. Email [irprograminfo@austinenergy.com](mailto:irprograminfo@austinenergy.com).
10. See DCM (Section 1.9) if your load is larger than 225 amps (three phase) or 350 amps (single phase) for CT configuration criteria.
11. City Ordinance requires Austin Energy to collect 100% of the cost for line extensions and new infrastructure associated with requests for new electric service (DCM 1.3.12).

## **Submitting Documents to AE Design**

Visit [austinenergy.com](http://austinenergy.com) (search "Complete an Intake Form") and fill out the Design Intake Form when you are ready to submit your project to AE Design. The form states the required documents for each project type. The Design Intake Process improves the customer experience with AE Design by concisely communicating project submittal requirements and providing our customers with visibility into design intake status. To take full advantage of the process and avoid delays/additional costs to your project, please make sure that all information is Complete, Accurate, and Consistent between forms and drawings. The information requested during Design Intake is used as follow:

- Design Intake Form: Initiates your project into the AE Design Intake Process and allows the customer to track their project throughout Design Intake.
- Non-ESPA Submission Requirements: Provides Austin Energy supporting documentation to properly size, locate, construct, and maintain electrical facilities on your property.
- ESPA Form: Required by Austin Energy to assess the sites' electrical needs, and it is also used as a reference during the Inspection phase of the project.

## **Distribution Design Information**

### **North & South Service Centers**

Distribution Design Teams - Northwest, Northeast, North Small-Scale, North Major Projects  
 Distribution Design Teams - Southwest, Southeast, South Small-Scale, North Major Projects

### **AE Distribution Design Structure**

Designer, Design Lead, Design Supv. Design Mgr., Design Process Mgr.

## **AE Distribution Design Preliminary Design Table Contents**

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## 2. ADDITIONAL INFORMATION

Common AE Design Criteria Manual References (See current DCM for more information)	
<p><b>Availability of AE Facilities (1.3.2):</b> Not all service voltages, service styles, or demand ampacities are available at all locations. The characteristics of electric service (voltage, number of phases, capacity, and so forth) that are available and can be supplied at a given location shall be at the sole determination and judgment of AE Design.</p> <p><b>One Service Point and One Service Voltage (1.3.3):</b> As a standard service, AE supplies one service point at one service voltage to a single building or point of service located on a single lot or tract of land. The one electric service shall be of sufficient ampacity and capacity to provide power to all buildings or structures located on the same single tract of land. Some exceptions allowing multiple service points are noted in this Design Criteria based upon load size, building size, and building occupancy. Other exceptions may be allowed under the requirements for Excess Facilities/Excess Cost Policy (DCM 1.3.13). Exceptions not expressly allowed under this Design Criteria Manual must be reviewed and approved by AE design.</p> <p><b>Customer Electrical Facilities that Cross Property Lines (1.3.8):</b> A Customer may not extend or connect any electrical facilities served from AE electric energy sources across property lines to a Customer's installation on another property or across, under, or through a public street, alley, right of way, public space or other private space in order to provide electric service for this adjacent property. However, a Customer who owns physically adjacent properties that are developed and operated as a unified development may extend or connect the installation to lines across or under the property lines of said adjacent properties as interpreted by AE in order to serve said properties through one point of service.</p>	<p><b>AE Excess Facilities/Excess Cost Policy (1.3.13):</b> Excess cost applies to anything requested by the Customer that exceeds what AE would provide as adequate and reliable standard electric service to serve the Customer's electrical demand and energy needs. This cost applies but is not limited to Customer requests for conversion of overhead to underground service, excess transformer capacity, equipment/work to increase reliability, specific placement or routing of AE facilities, relocations/removals of AE facilities, additional points of service, and other similar services. The Customer will be required to pay the full amount of any excess facilities and/or excess costs including any applicable fees as outlined in the current Council Approved Fee Schedule, Customer-requested and necessitated overtime, and any anticipated future operating costs.</p> <p><b>AutoCAD Requirements (1.4.2.6, 1.14.2.1, &amp; 1.16.0):</b> A 1:1 scaled AutoCAD file of the Civil &amp; Utility Site Plan with preferred transformer &amp; meter locations and must be bound without XREF reliance. Formatting must follow Coordinate System: TX83-CF. See DCM for full list of requirements.</p> <p><b>NOTE (1.3.9):</b> Customer changes/upgrades to existing service entrance facilities on the Customer's side of the point of service (such as replacing the main disconnect switch) may require that the entire service entrance is brought up to current code requirements. Check with the COA Electric Inspection Section.</p>

How Can the Customer Help?
<p>AE Design diligently works to get your design to you as soon as possible. When timelines are tight our customers often ask how they can help AE Design expedite the process. The process is most streamlined when the customer:</p> <ul style="list-style-type: none"> <li>-Carefully designates the Single Point of Contact (SPOC), Updates AE Design when the SPOC needs to change, and Avoids non-SPOC communication with the AE Design team.</li> <li>-Updates AE with revisions to your submitted documents and limits design changes whenever possible (design changes often require AE Design to contact internal and external workgroups for more information, and each workgroup has their own lead times before they can respond). Significant delays can be expected if major design changes are requested by the customer after approving the preliminary print, or if the customer requests significant changes after the Design Review Process has been completed (a re-design fee will also be assessed).</li> <li>-Coordinates with AE Design in order to obtain a Right-of-Way (ROW) Permit and/or an engineered Traffic Control Plan. Obtaining a ROW Permit is a pre-requisite to releasing the job to our crews for scheduling. Austin Energy/Contractors must be noted on the permit for AE/AE Contractor crews to work under your permit.</li> <li>-Determines whether they will execute a Blanket, Specific Distribution, or a Public Utility easement early on in the project (if required). AE encourages blanket easements. See Page 3 for more information.</li> <li>-Completes their tree-trimming before AE Design will release the job to our crews for scheduling. AE Tree Trimming will trim trees near overhead powerlines.</li> </ul>

High-Level Project Timeline				
Pre-Design	Design Intake	Design	Construction	Requesting Service
<p><b>Customer</b></p> <ul style="list-style-type: none"> <li>-Request a Service Availability Letter if confirmation that your project is in AE's service area is needed.</li> <li>-Review Preliminary Design Tables When Considering Design Options (Optional)</li> <li>-Review DCM Section 1.9 for Meter Requirements</li> <li>-Assign Single Point Of Contact (SPOC)*</li> <li>-Complete Design Intake Form &amp; Submit Required Information Per Project Type</li> </ul> <p>*The SPOC Can Change at Any Point of the Project, But AE Design Must Be Notified to Avoid Delays in Your Project</p>	<p><b>Intake Admin</b></p> <ul style="list-style-type: none"> <li>-Receives Design Intake Form</li> <li>-Design Intake Completeness Check</li> <li>-Reach Out to Customer if Document Requirements Are Not Met.</li> </ul> <p><b>Design Lead</b></p> <ul style="list-style-type: none"> <li>-Technical Review</li> <li>-Communicate Options</li> <li>-Assigns the Project a Work Request Number (WR#)</li> <li>-Assigns a Designer to the Project</li> </ul>	<p><b>Designer</b></p> <ul style="list-style-type: none"> <li>-Meet/Call and Answer Questions</li> <li>-Works Projects in Order Received (Queue)</li> <li>-Develop preliminary print for customer approval while coordinating with internal/external workgroups (for easements, material, etc.)</li> <li>-Obtain Approved Design (Includes Review Process)</li> <li>-Provide Customer Quote</li> <li>-Complete Project Requirements After Customer Payment</li> <li>-Release the Design to the Customer (if Civil Work is Required) and AE Construction for Scheduling</li> </ul>	<p><b>AE Tree Trimming</b> - If Required</p> <p><b>AE Work Management</b></p> <ul style="list-style-type: none"> <li>-Receives Work Packet From AE Design</li> <li>-Processes Work In Order Received</li> <li>-Performs Civil Inspection (if required)</li> </ul> <p><b>AE Construction</b></p> <ul style="list-style-type: none"> <li>-Schedules, Work, Installs Equipment, &amp; Energizes AE Infrastructure</li> </ul> <p><b>CT Metering</b></p> <ul style="list-style-type: none"> <li>Install and Inspect CT Meter installation</li> </ul>	<p><b>Customer</b></p> <p><b>CT Metered Service</b></p> <ul style="list-style-type: none"> <li>-Ensure CT Meter Installation/Inspection (by AE), and COA Electrical Inspection are Complete</li> <li>-Call 512-494-9400 to Apply for Service**</li> </ul> <p><b>Non-CT Metered Service</b></p> <ul style="list-style-type: none"> <li>-Call 512-494-9400 to Apply for Service**</li> </ul> <p>**Have Your WR# &amp; One of the Following Ready When You Call: Tax ID#, Driver's License, I-10, Or Social Security Number</p>

### 3. OH/UG EASEMENTS AND ACCESS TO AE INFRASTRUCTURE

Construction	AE Facilities	Standard Easement	Minimum Clearance	Minimum Access to Equipment for "AE Truck Accessibility"
Underground	Underground Facilities (i.e., transformer, switchgear), Pullbox, and Manholes on Customer Property	Pad size & 5 ft. around pad OR Pullbox/Manhole size & 5 ft. from pullbox/manhole underground edge	To Transformer Pad: See Page 4  To Switchgear Pad: See Page 6	All equipment shall be locked with an AE lock and accessible to AE personnel.  AE Infrastructure must be truck accessible (w/in 6' of parking/traffic areas). A parking lot can serve as access. Maximum road grade is 12 percent.  Road Material All weather road (i.e., concrete, asphalt, grasscrete), or another prepared surface (i.e., caliche, roadbase, crushed granite) Supports 40 tons  Entry Access Minimum 12' wide Minimum 16' vertical Supports 40 Tons  Setup Area Minimum 20' x 35' wide area Minimum 20' Overhead Clearance (35' for building niche) Supports 40 Tons Setup Area must be flat and even grade
	Non-Main Line Duct Bank: Primary or Secondary UG Lines on Customer Property	10 ft parallel to AE Truck Accessible Road AND/OR 10 ft. centered on conduit	To Conduit: See Page 7  To Pullbox and Manhole: See Page 8	
	Main Line Duct Bank on Customer Property	15 ft parallel to AE Truck Accessible Road AND/OR 15 ft. centered on conduit	To UG Clearance Diagrams: See Page 10	
Overhead	Existing AE Facilities#: Single Phase	10 feet centered on pole	ABOVE/BELOW CONDUCTOR: Nothing allowed	
	Existign AE Facilities#: Three Phase	15 feet centered on pole	HORIZONTAL (TO STRUCTURE): Nothing allowed within 7.5 ft of nearest conductor (sky to ground) AND 15 ft. radius from nearest primary/neutral conductor (or 10 ft. radius to nearest secondary conductor).	
	Along ROW: Single Phase	Determined by Street Level*: Level 0-2: 10 ft.^ Level 3-4: 15 ft.	See Page 9 for OH Clearance Diagrams	
	Along ROW: Three Phase	Level 5: 20 ft.		

NOTICE: Austin Energy will not energize any transformer and/or associated electric facilities until the appropriate Electric Utility Easements have been executed. Per COA Code #15-9-37, by accepting electric service from AE, the Customer accepts and grants to AE the construction, placement, and maintenance access rights for these facilities (see also Section 10 – Clearance and Safety Requirements and specifically Section 1.10.10 Customer Activities in Utility Easements.)

^AE will require 15 ft. if three phases are needed in the future

\*See Austin Transportation's Street Design Guide for definitions of street levels.

# While new overhead construction requires street access, there are instances where legacy overhead construction is located on customer property without street access. For these scenarios, AE will request the standard easement shown above. If the overhead line is along the property line of two customers, AE will request the easement be split between the two customers.

-Front lot construction is standard at AE. Rear lot construction is permitted for new developments and sites only if there is a permanent paved surface that is AE truck accessible for installation and maintenance purposes.

-Austin Energy complies with the Americans with Disabilities Act (ADA) regarding the installation of new facilities. Also, where existing AE facilities do comply with the ADA, AE will not modify or relocate these facilities such that they are not in compliance with the ADA.

-Customer should be aware of overhead and underground electric facilities and their easements. The Customer's facilities, including, but not limited to buildings, signs, swimming pools, spas, decks, carports, garages, water and wastewater infrastructure, equipment or any other structure shall not be installed over or under these electric facilities or in an easement.

**Blanket Easement:** Austin Energy encourages customers to execute a blanket easement at the beginning of their project as a blanket easement allows the customer to shift electric facilities (due to tree roots, other utilities, etc.) during construction without significant delays. Upon the completion of installation, the blanket easement is either replaced with a specific easement where the lines and equipment are installed (as requested by the customer), or the easement area will automatically shrink to five feet on all sides of electric facilities. 99% of blanket easements remain in place after construction is complete.

**Specific Distribution Easement:** Good choice for customers if electric facilities follow the property line of a subdivided lot. Austin Energy discourages customers from executing this type of easement at the beginning of their project as it does not allow for shifting of electric facilities during construction, which can cause significant delays.

**Public Utility Easements (PUE):** Austin Energy has the ability to use a PUE, but prefers an electric easement. Austin Energy's use of a PUE is dependent on which utilities are within the PUE currently, and which utilities plan on utilizing the PUE in the future.

**Subdivisions:** Subdivision applicant is required by the City of Austin Land Development Code to grant easements for electric facilities. Austin Energy always acquires easements along road rights-of-way to aid in the future expansion of our infrastructure.

-All easements shall be dedicated to public use for the named purpose and shall be aligned to minimize construction and future maintenance costs.

-All easements shall be shown on the face of the plat.

-AE does not require an easement nor access to customer service wire or conduit

-It is the responsibility of the customer to coordinate the site's utilities (AULCC, DAPCZ, etc.) when equipment (conduit) is located in the Right of Way.

## 4. PADMOUNT TRANSFORMER INFORMATION

P A D M O U N T  T R A N S F O R M E R	Single or 3-Phase	Secondary Voltage	Sizes (kVA) [7]	Pad Size	Conduits in Pad [5]	Point of Service [6]	Easement	Minimum Clearance to Edge of Pad [1]
	Single Phase	120/240	25, 50, 75, 100, 167	5' x 5'	<u>Primary:</u> 2-2" <u>Secondary:</u> 4 - 3" 1 -2" STLT 1-2" Const.	At Pullbox for all Commercial lots, Apartments, Condos, and Townhomes  At Meter for Subdivisions, Single/Multi-Family home OR at Meter Pedestal/Rack	Pad size & 5 ft. around pad (15' x 15')	ABOVE (Niche Only): 35 ft. (min.) above pad [2] BELOW (Niche Only): 3 ft. from bottom of conduit (customer to provide licensed engineer approval) HORIZONTAL*: 5 ft. (Non-operating), 10 ft. (Operating) and level^# [3][4] LATERAL: 5 ft. from edge of pad to edge of windows, doors, and ventilating ducts VERTICAL (from grade): 12 ft. to edge of windows, doors, and ventilating ducts when within 5 ft LATERAL  *Includes structures (trees, plants, non-removable and non-ventilated fences, buildings, foundations, walls, etc.) and retention ponds and/or surface or subsurface rain-gardens. Clearance applicable only to brick or masonry structures with minimum 2-hour fire rating except as noted in the "Exceptions to horizontal pad clearance" notes below.
Three Phase	120/208	75, 150, 300, 500, 750	10' x 10'	<u>Primary:</u> 2-4" <u>Secondary:</u> 10-4" 1-2" Const. 1-1.25" CT	Secondary Terminals of XFMR (serves one customer and has CT Metering Equipment in secondary compartment)	Pad size & 5 ft. around pad (20' x 20')	^Clearance can be met by facing padmounted equipment toward AE approved access road or parking lot	
	277/480	75, 150, 300, 500, 750, 1000, 1500, 2000, 2500					#Exceptions to HORIZONTAL, LATERAL, & VERTICAL pad clearances: -12 ft. HORIZONTAL from all pad sides to non-brick or non-masonry structure -12 ft. HORIZONTAL from all pad sides to fixed structure or building if windows, doors, or ventilating ducts less than 12 ft VERTICAL from grade or within 5 ft LATERAL  -20 ft. LATERAL from fire escapes or stairs that serve as a fire escape -10 ft. to water's edge of swimming pool, hot tubs, saunas, etc. (See also Page 10 for Underground Clearance Diagrams)	

[1] Transformers must be located on customer property (not in Right of Way) and within 6 feet from back of curb (or approved drivable surface) or 2 feet from back of sidewalk. Transformers cannot be placed near flammable liquids (per NEC).

[2] For structures above the pad, all walls in the niche shall have a 3-hour fire wall and must be properly ventilated.

[3] Clearance may be reduced to 3 ft (with AE Design approval) from one side of the pad (side without pad lock) only if the lateral clearance to the pad is 10 ft. or more to windows, doors, or ventilating ducts and only if vertical clearance to the pad is 15 ft. or more to windows, doors, or ventilating ducts. The 3 ft. clearance only applies to structures with minimum 3 hour fire rating in the area.

[4] Clearance to any removable ventilated obstruction (fence) to transformer non-operating sides is 3 feet, and 5 feet to operating sides. Ventilated fences must be pre-approved by AE Design.

[5] Only one circuit of customer secondary service conductor can be installed per conduit. Primary conduit to be concrete encased for commercial projects.

[6] Distance from P.O.S. to customer disconnect for Apartments, Condos, and Townhomes is 75 ft, and 150 ft. for all other residential and commercial installations.

[7] For the purpose of sizing AE facilities, AE Design shall determine the maximum expected Customer demand load amps that will be seen by AE facilities from the Customer's total connected undiversified load information and business type as documented on the ESPA form. AE facilities will be sized by AE Design accordingly.

-Underground equipment is not allowed within the 100 year flood plain.  
 -When equipment pad is installed within 4 feet of parking/traffic areas, 4-inch minimum galvanized rigid metal barrier posts shall be installed.  
 -For oil-filled equipment, liquid flow for the area surrounding the equipment should always be away from the building.  
 -Customer is responsible for determining and ensuring OSHA clearances are met.

## 5. RISER INFORMATION

	Riser Type	Single OR 3-Phase	AE-Installed Riser Conductor to Pullbox # (& XFMR Size, if applicable)	Conduit Up Utility Pole (by Customer)	90 Degree Bend at Utility Pole	Conduits from 90 Degree Bend to Pullbox (by Customer)	Riser Pullbox (by Customer)	Max Secondary OR Service Lateral Conductor(s)* in Pullbox	Distance from Utility Pole to Riser Pullbox
<b>P R I M A R Y &amp; S E C O N D A R Y R I S E R S</b>	Primary Riser	Single (7,200V L-G)	1-1/0 URD : 25, 50, 75, 100, 167 kVA	Rigid Galv. Steel 10 Feet 2 - 3" Conduits	Min. 24" Radius Rigid Metal (Min. 3" Concrete Encased)	2-3" Conduits Schedule 40 PVC (Commercial: Min. 2" Concrete Enc)	36" Normal OR 36" Traffic Type	1 Set of 350 kcmil	Min. 5 ft. Max. - 25 ft.
		3-Phase (12.47kV L-L)	3- 1/0 URD: XFMR Sizes: 75, 150, 300, 500, 750, 1000, 1500, 2000, 2500 kVA	Rigid Galv. Steel 10 Feet 2 - 4" Conduits	Min. 24" Radius Rigid Metal (Min. 3" Concrete Encased)	2-4" Conduits Schedule 40 PVC (Commercial: Min. 2" Concrete Enc)	48" Normal OR 48" Traffic Type	2 Sets of 350 kcmil	
		3-Phase Mainline (12.47kV L-L)	1000 kcmil, 500 kcmil OR 250 CU	Rigid Galv. Steel 10 Feet 2 - 5" Conduits	Min. 24" Radius Rigid Metal (Min. 3" Concrete Encased)	2-5" Conduits Schedule 40 PVC (Commercial: Min. 2" Concrete Enc)	Manhole	N/A	
	Secondary Riser	1-Phase (120/240V) 18" Pullbox	10kVA - 4/0 AL TP 25kVA - 4/0 AL TP 50kVA - 4/0 AL TP 75kVA - 2-4/0 AL TP	Rigid Galv. Steel 10 Feet 2 - 3" Conduits	Min. 24" Radius Rigid Metal (Min. 3" Concrete Encased)	2-3" Schedule 40 PVC	18" Normal OR 18" Traffic Type	4 Sets (total) of 4/0 TP (total sets includes AE conductors*)	
		1-Phase (120/240V) 36" Pullbox	75kVA - 350 AL TP 100kVA - 2-350 AL TP 167kVA - 2-500 CU TP	Rigid Galv. Steel 10 Feet 2 - 3" Conduits	Min. 24" Radius Rigid Metal (Min. 3" Concrete Encased)	2-3" Schedule 40 PVC	36" Normal OR 36" Traffic Type	5 Sets (total) of 750 kcmil (total sets includes AE conductors*)	
		3-Phase (208Y/120V) 48" Pullbox	30kVA - 1/0 AL QP 75kVA - 350 AL QP 150kVA - 2-350 AL QP 225kVA - 2-500 CU QP 300kVA - N/A 501kVA - N/A	Rigid Galv. Steel 10 Feet 2 - 4" Conduits	Min. 24" Radius Rigid Metal (Min. 3" Concrete Encased)	2-4" Schedule 40 PVC	48" Normal OR 48" Traffic Type	6 Sets (total) of 750 kcmil (total sets includes AE conductors*)	
		3-Phase (480Y/277V) 48" Pullbox	30kVA - 1/0 AL QP 75kVA - 4/0 AL QP 150kVA - 4/0 AL QP 225kVA - 350 AL QP 300kVA - 2-4/0 AL QP 501kVA - 2-500 CU QP	Rigid Galv. Steel 10 Feet 2 - 4" Conduits	Min. 24" Radius Rigid Metal (Min. 3" Concrete Encased)	2-4" Schedule 40 PVC	48" Normal OR 48" Traffic Type	6 Sets (total) of 750 kcmil (total sets includes AE conductors*)	

# Secondary conductor subject to change based on voltage drop or construction needs

\*The size and number of conductors shown is based on a worst case scenario and does not mean that Austin Energy would install the sizes shown.

^Austin Energy will install secondary in a primary pullbox, but will not allow this pullbox to be the point of service. The customer cannot have access to any pullbox with primary conductor.

-The secondary riser pullbox at the base of the pole is typically designated as the point of service (P.O.S.). Customers shall locate their meter/disconnect within 150' (max) from the AE P.O.S.



## 6. SWITCHGEAR INFORMATION

S W I T C H G E A R	Switchgear Type	Layout	Conduits	Pad Size	Easement	Minimum Clearance to Pad from Permanent Structures [1]
	PME-9	Load Line Load Line	2-4" 2-4" 2-5" 2-5" Total: 4-4" & 4-5"	6' X 7'	Pad size & 5 ft. around pad (16' x 17')	ABOVE (Niche Only): 35 ft. (min.) above pad [2] BELOW (Niche Only): 3 ft. from bottom of conduit (customer to provide licensed engineer approval) HORIZONTAL*: 5 ft. (Non-operating), 10 ft. (Operating) and level^[3][4] LATERAL: 5 ft. from edge of pad to edge of windows, doors, and ventilating ducts  *Includes structures (trees, plants, non-removable and non-ventilated fences, buildings, foundations, walls, etc.) and retention ponds and/or surface or subsurface rain-gardens. Clearance applicable only to brick or masonry structures with minimum 2-hour fire rating.  ^Clearance can be met by facing padmounted equipment toward AE approved access road.  -10 ft. to water's edge of swimming pool, hot tubs, saunas, etc. -20 ft. LATERAL from fire escapes or stairs that serve as a fire escape
	PME-12	Load Line Load Line	2-4" 2-4" 2-5" 2-4" Total: 6-4" & 2-5"			
	PME-10	Line Line Line Line	2-5" 2-5" 2-5" 2-5" Total: 8-5"	7' x 7'	Pad size & 5 ft. around pad (17' x 17')	
	PME-11	Load Line Line Line	2-4" 2-5" 2-5" 2-5" Total: 2-4" & 6-5"			
	Vista	3 Ways OR 4 Ways OR 6 Ways	2-5" per Way	10' x 10'	Pad size & 5 ft. around pad (20' x 20')	
	PME ATO	Load Line Line Line	2-4" 2-4" 2-5" 2-5" Total: 4-4" & 4-5"			
Double Tank ATO	Load Line Line Line	2-5" 2-5" 2-5" 2-5" Comm: 4" Total: 1-4" & 8-5"				

Pad-mounted switchgears are a convenient method to sectionalize underground feeders and feeder laterals and provide URD circuit tap points to serve large underground commercial and residential areas. While many factors determine whether a switchgear is needed, the likelihood of needing a switchgear increases for these types of projects:

**Commercial**  
 -Removing overhead power lines in a congested area AND the building is constructed from "lot line to lot line."  
 -Dual feed projects

**Subdivision**  
 -Utilizing a three-phase load (lift station)  
 -More than 300 lots

**General**  
 - Converting an overhead line with a junction pole to an underground service.

Note: The above project types do not cover all instances of when a switchgear is necessary. AE Design reserves the right to determine if a switchgear is required for any project. Costs vary from the switchgear types, and the addition of a switchgear may require a full duct bank and manholes.

[1] Switchgears must be located on customer's property and within 5 feet from back of curb or 2 feet from back of sidewalk. Switchgears cannot be placed in the right of way.

[2] For structures above the pad, all walls in the niche shall have a 3-hour fire wall and must be properly ventilated.

[3] Clearance to any removable ventilated obstruction (fence) to transformer non-operating sides is 3 feet, and 5 feet to operating sides. Ventilated fences must be pre-approved by AE Design.

[4] Clearance may be reduced to 3 ft (with AE Design approval) from one side of the pad (side without pad lock) only if the lateral clearance to the pad is 10 ft. or more to windows, doors, or ventilating ducts and only if vertical clearance to the pad is 15 ft. or more to windows, doors, or ventilating ducts. The 3 ft. clearance only applies to structures with minimum 3 hour fire rating in the area.

Underground equipment is not allowed within the 100 year flood plain.  
 When equipment pad is installed within 4 feet of parking/traffic areas, 4-inch minimum galvanized rigid metal barrier posts shall be installed.

## 7. CONDUIT INFORMATION

C O N D U I T	Type	Min. Depth*	Material	Sizes	Minimum Clearance on Customer Property for Underground Facilities (Cable, Conduit, Duct Structure, Pullboxes, Manholes, and Underground Facilities)
	Service	24"	Sch. 80 PVC	3", 4", or 5"	Cannot be under or through a building or structure (meter rooms must be approved by Distribution Metering)
	Secondary Res. & Comm.	24"	Sch. 40 PVC (w/ sand) Sch. 80 PVC (w/o sand)	1PH: 3" 3PH: 4"	Permanent structures*: 5 ft. HORIZONTAL Public Utilities: 12 in. HORIZONTAL (and 12 in. minimum VERTICAL, if crossing <sup>^</sup> ) Private Utilities (including Septic/Drain Systems, etc.), : 5 ft. HORIZONTAL (no crossing) Gas (under 60 psi): 2 ft. minimum HORIZONTAL and 6 inch minimum VERTICAL Gas (60 psi & over)/Steam/Fuel Line: 3 ft. minimum (HORIZONTAL and VERTICAL)# Swimming Pool/Man-made Ret. Pond/Sauna/Hot Tub: 5' horizontal to water's edge or diving platforms Railroad - 50 in. below railroad tracks  *Examples of Permanent Structures includes, but not limited to: buildings, foundations, stairs, steps, walls, etc. No customer permanent structure shall be installed over AE underground facilities (variations permitted only for Customer-installed vault installations in Network, or by written permission from AE Design).  <sup>^</sup> If crossing AE underground facilities, 12 inch minimum VERTICAL clearance. In addition, AE conduit must be concrete encased (2 in.) for a minimum of 24 in. on either side of crossing if required by AE Design.  # Requires 3 inch concrete encasement of AE conduit for 36 inches on both sides of crossing when AE conduit is installed above the other utility conduit.  Conduit may be installed under sidewalks, parking lots, and road crossings.
	Primary - Residential	30"	Sch. 40 PVC	1PH: 2" 3PH < 250MCM: 4" 3PH > 250MCM: 5"	
	Primary - Commercial	30"	Sch. 40 PVC Concrete Encased (Min. 2")	All Power Cable: 5" (5" or 6" to be concrete encased)	
	Feeder Duct	30"	Sch. 40 PVC Concrete Encased (Min. 2" Below, 3" Above, 2" Sides)	Varies (i.e., 9-5", 3-4", 2-2")	
	Street Crossing or in COA Public Right of Way - Commercial	36"	Sch. 40 PVC Concrete Encased (Min. 2")	See Secondary and Primary Above	
Street Crossing or in COA Public Right of Way - Residential	36"	Sch. 40 PVC	See Secondary and Primary Above		

\*Minimum depth from final grade to the top of the conduit (or the top of concrete if encasement is required)

Only communication cables are allowed in the same trench with AE facility conduits and shall be installed a minimum of 6" above and to the side of the top of the electrical conduit.

Only one circuit of customer secondary service conductor can be installed per conduit

# Other utilities may have different clearance requirements

The 90 degree bend to a padmounted transformer should be concrete encased.

Underground primary on commercial lots are required to be concrete encased

Cable Pulling Tension Considerations when Austin Energy installs Primary URD or tri-plex secondary/service cable:

Straight pull from pullbox to pullbox -- 400 feet maximum

From pullbox to transformer w/ 1-90 degree bend -- 400 feet maximum

From riser or transformer to transformer w/ 2-90 degree bends -- 250 feet maximum

## 8. PULL BOX & MANHOLE SIZE DETERMINATION

Pullbox Size (Point of Service)	Service Type	Maximum Size and Number of Conductors (Including AE & Customer Conductor)
18"	Single Phase	4 Sets (total) of 4/0 (total sets includes AE conductors*)
36"	Single Phase	5 Sets (total) of 750 kcmil (total sets includes AE conductors*)
48"	Three Phase (Secondary Riser Only)	6 Sets (total) of 750 kcmil (total sets includes AE conductors*)

**Notes:**

- The size and number of conductors shown is based on a worst case scenario and does not mean that Austin Energy would install the sizes shown.
- Streetlight circuits can be added to any pullbox as the conductors are small
- As a general rule, 48" pullboxes are used only for 3 phase circuits
- The number of penetrations for a pullbox is important, but does not play a factor when dealing with a secondary pullbox. In general, the size and number of conductors are the biggest determining factors for a secondary pullbox.

Pullbox Size (for Primary Conductor)	1/0 AL Primary	Wraps/Coils	350 AL Secondary Runs (Single or Three Phase)
36"	Single Phase	3	1
48"	Single Phase	4	2
48"	Three Phase	3	2

**Notes:**

- The maximum penetrations for each pullbox size (18": 4-3" conduits, 36" - 10 penetrations, and 48"-12 penetrations) are considered in the table above.
- If additional wraps/coils are required for a pullbox, stagger another pullbox in your design to avoid more than the maximum number of cable wraps. A "wrap" of cable is a coil of cable in the pull box to provide extra wire for future use and to get cable to exit points without over-bending it.

**Other Pullbox Information**

48" Pull boxes are required whenever it is necessary to stack 2 pullboxes  
For all new residential and commercial underground areas, the transformer pads and the pull boxes should be stubbed out for future streetlights.

**Clearance:**

Horizontal: 5 ft. from pullbox/manhole underground edge to structures\*^

\*Includes structures (utility poles, plants, non-removable and non-ventilated fences, buildings, foundations, walls, septic fields, etc.) and retention ponds and/or surface or subsurface rain-gardens.

^The designer should verify the pullbox or manhole does not sit under overhead AE facilities.



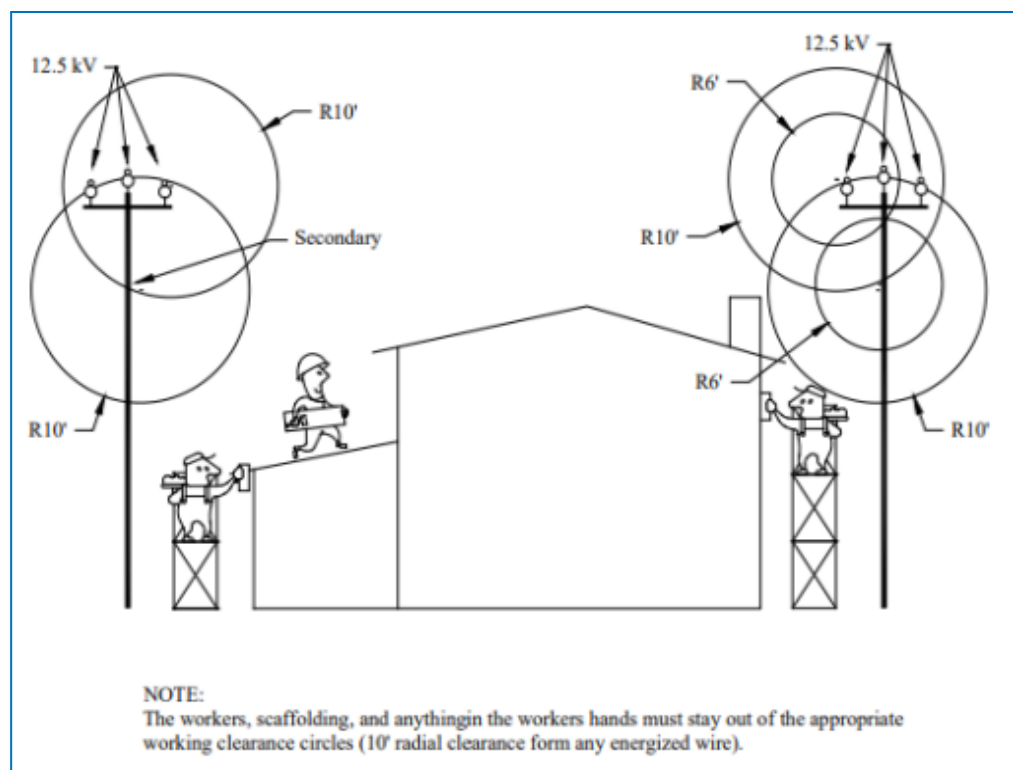
# 9. OVERHEAD CLEARANCE DIAGRAMS

1-36	OSHA/TEXAS SAFETY CODE	
SHEET 1 OF 1	OVERHEAD WORKING CLEARANCES	
11/05/03	FROM OVERHEAD LINES FOR UNQUALIFIED PERSONS	REV. 05/25/12

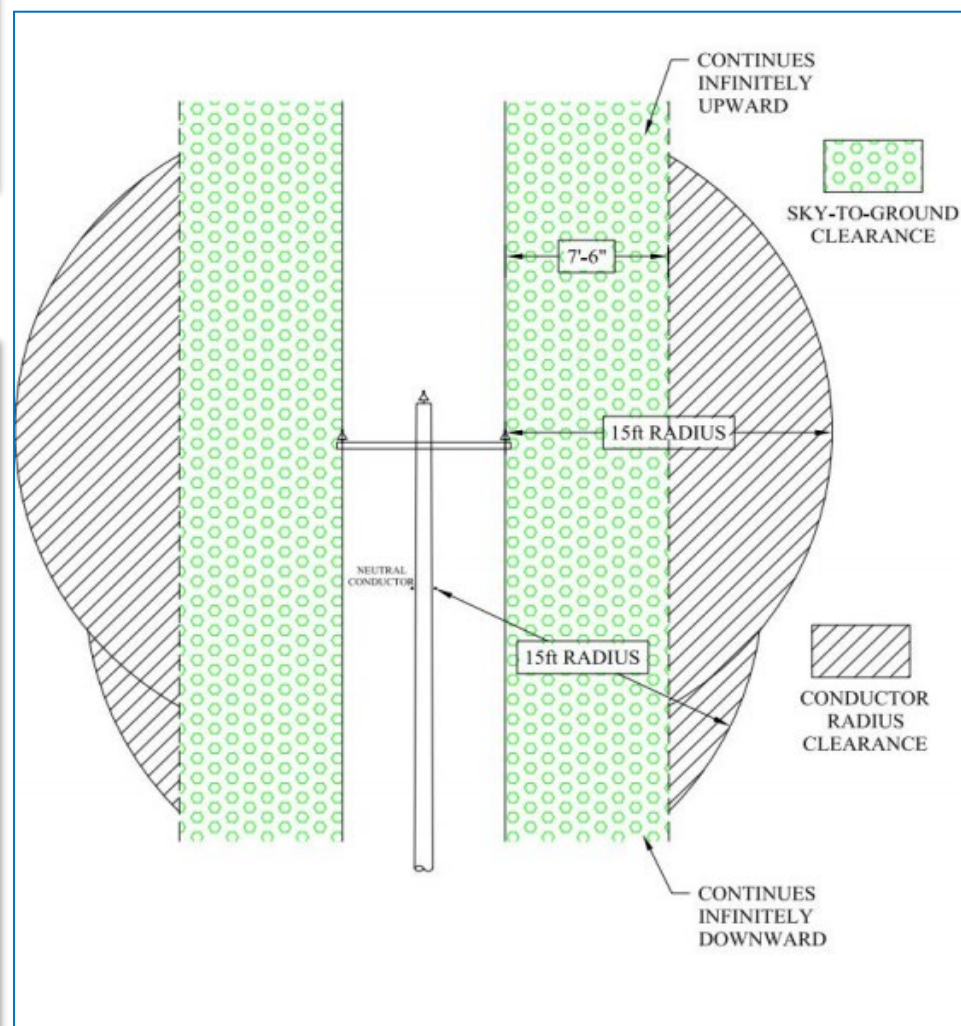
OSHA/Texas Safety Code Working Clearances from Overhead Lines For Unqualified Persons

OSHA 1910.333(c)(3)(i)(A/A1), 1910.333(c)(3)(i)(B)  
When an unqualified person is working in an elevated position near overhead lines (or on the ground in the vicinity of overhead lines), the location shall be such that the person and the longest conductive object he or she may contact cannot come closer to any unguarded, energized overhead line than 10ft any direction, of live overhead high-voltage line (plus 4 inches of added clearance for each 10kV over 50kV).

Texas Health & Safety Code 752.003, 752.00, and 752.005  
**RESTRICTIONS ON ACTIVITIES NEAR LINES.**  
An entity responsible for temporary work in the vicinity of high voltage electric lines must notify the operator of the line (Austin Energy) at least 48 hours before the work begins. No work may begin until the persons responsible for the temporary work and the operator of the line (Austin Energy) have made satisfactory arrangements to de-energize and ground, move or relocate the line to prevent accidental contact. If an entity has not made the required notices and arrangements for temporary work as described here, an entity is subject to the restrictions on activities near lines and restrictions on operation of machinery and placement of structures near lines found in sections 752.004 and 752.005 of the Texas Health and Safety Code.



OSHA Texas Safety Code Working Clearances  
AE DCM, Page 149



AE Permanent Clearance Envelopes  
AE DCM, Page 90

1-34	OVERHEAD CLEARANCE	
SHEET 1 OF 1	SWIMMING POOL CONSTRUCTION FOR OVERHEAD FACILITIES	
10/16/03		REV. 05/25/12

REQUIREMENT	OVERHEAD GUYS OR NEUTRAL	BUNDLED OR CABLED SECONDARY OR SERVICE	OPEN WIRE SECONDARY OR SERVICE	POLE LINE OR PRIMARY CONDUCTOR	TRANSMISSION FACILITIES
A	22.5'	22.5'	25'	25'	SEE SECTION 1.14.0
B	14.5'	14.5'	17'	17'	
C	AS REQUIRED BY NESC SECTION 232				
D	HORIZONTAL LIMIT CLEARANCE MEASURED FROM INSIDE POOL WALL OR OUTER EDGE OF THE DIVING BOARD OR PLATFORM.				

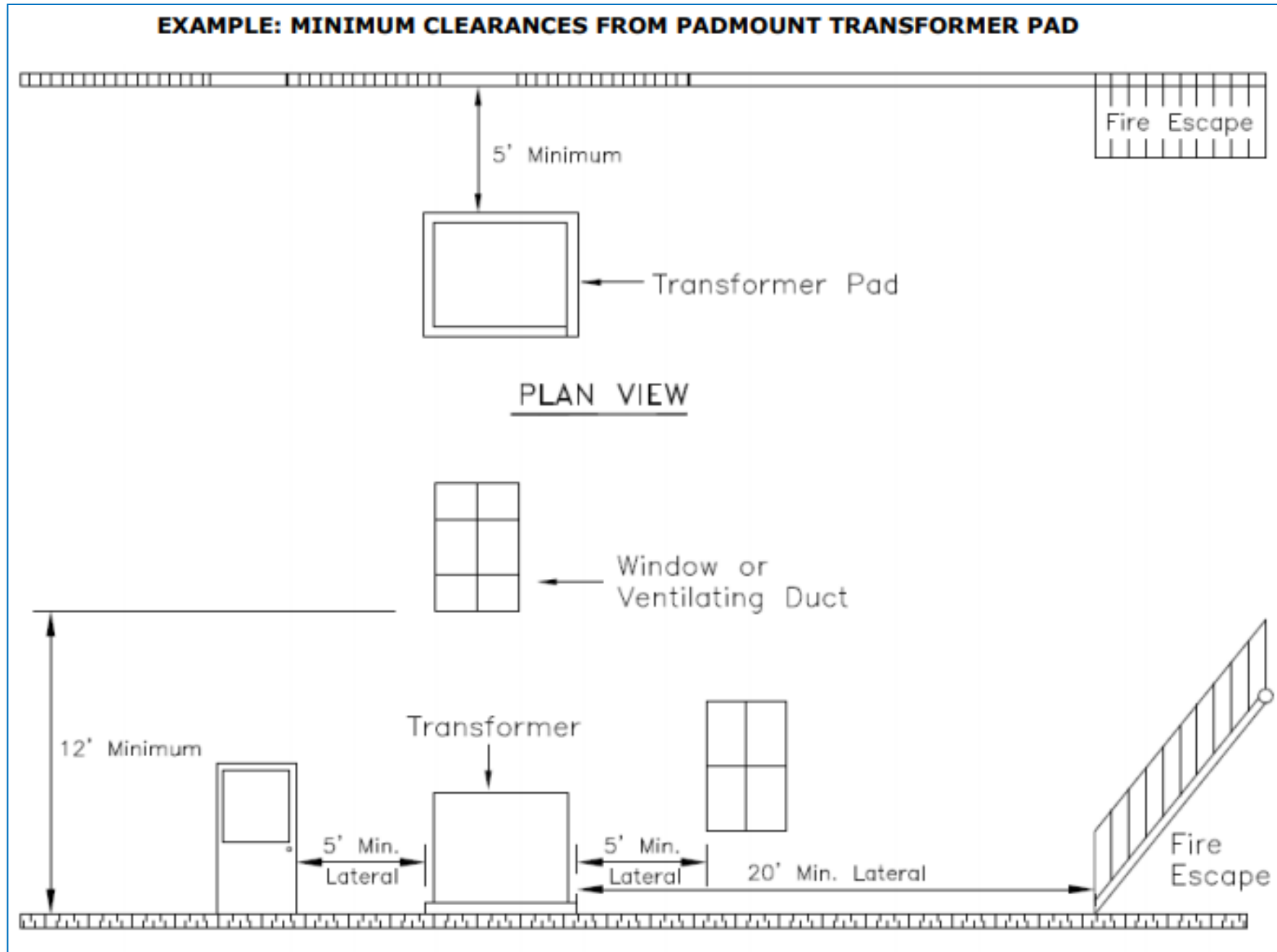
**CLEARANCE FROM SWIMMING POOL FOOT NOTES:**

A- CLEARANCE IN ANY DIRECTION TO THE WATER LEVEL, EDGE OF WATER SURFACE, BASE OF DIVING PLATFORM, OR PERMANENTLY ANCHORED DRAFT.  
 B- CLEARANCE IN ANY DIRECTION TO THE OBSERVATION STAND, TOWER, OR DIVING PLATFORM.  
 C. VERTICAL CLEARANCE OVER ADJACENT LAND.  
 D. THIS LIMIT SHALL EXTEND TO THE OUTER EDGE OF THE STRUCTURES LISTED IN A AND B, BUT NOT LESS THAN 10 FT. OVERHEAD CONDUCTORS SHALL NOT BE PERMITTED TO PASS OVER POLES.

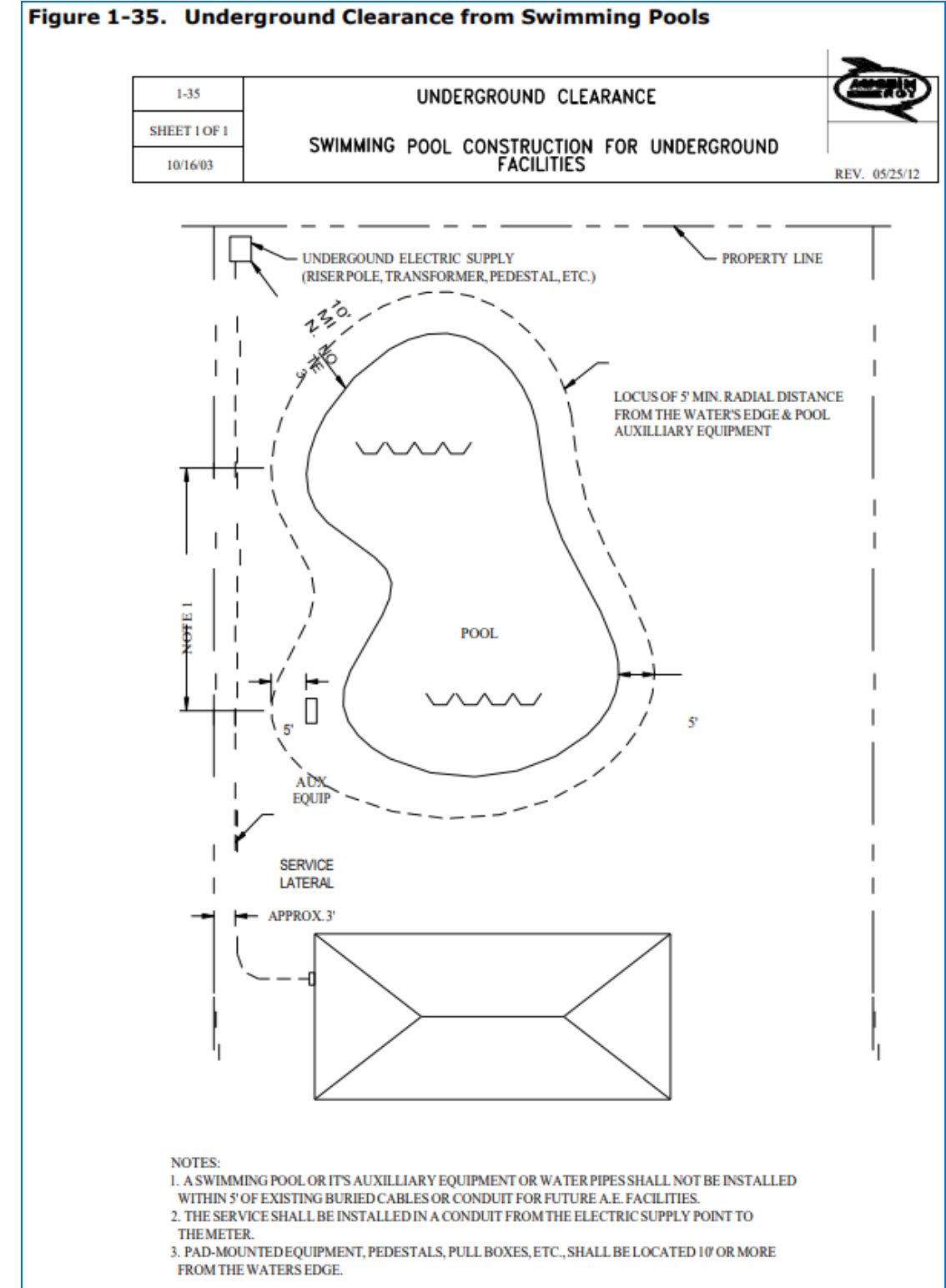
**NOTE:**  
THE ABOVE CLEARANCE VALUES ARE BASED UPON THE REQUIREMENTS OF THE NATIONAL ELECTRICAL SAFETY CODE (SECTION 234) AND NATIONAL ELECTRICAL CODE (SECTION 680.8).

Overhead Clearance From Swimming Pools  
AE DCM, Figure 1-34. Page 147

# 10. UNDERGROUND CLEARANCE DIAGRAMS



Minimum Clearance From Padmount Transformer Pad  
AE DCM - Page 98



Swimming Pools - Underground Clearance  
AE DCM, Figure 1-35. Page 152

# 11. TRUCK ACCESS DIAGRAM

3Ø Overhead Example  
Shown (Not to Scale)

See Overhead and Underground Easements and Access to AE Infrastructure (Page 3) for information specific to your project.

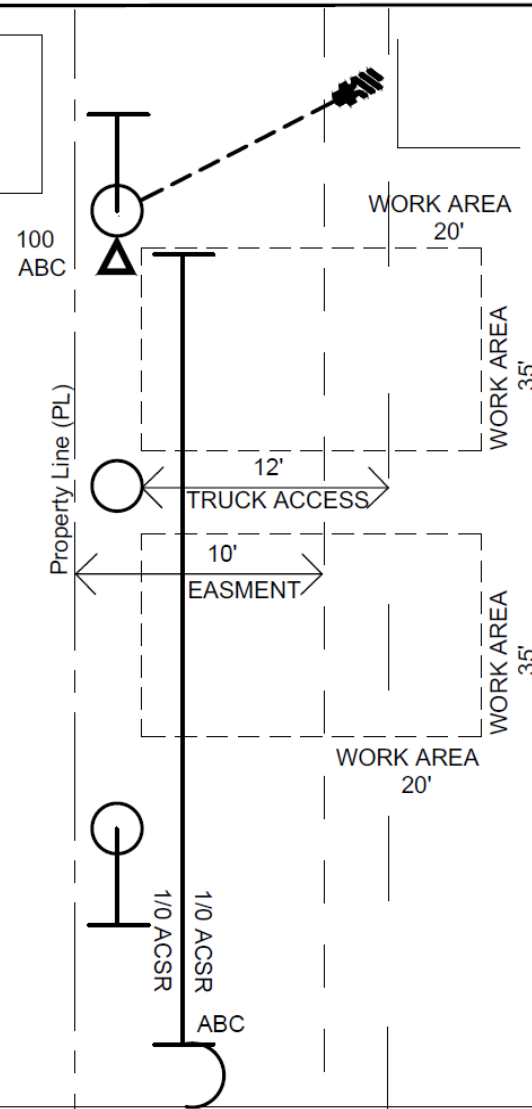
Truck Access = 12' Horizontal  
16' Vertical  
Truck Work Area = 20' X 35'  
20' Vertical

\* Work Area to be on a level plane

Possible Truck access (Road) material:

- Crushed Granite
- Pressed Caliches
- Bull Rock
- Black top
- Concrete

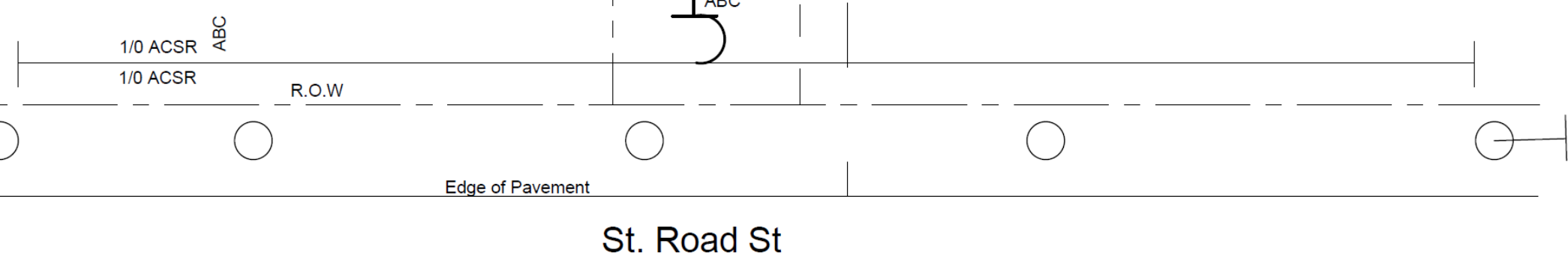
\* All material must withstand total weight 40 Tons & MAX grade of 12 percent



THE TYPICAL SET UP FOR A TRUCK WOULD BE ON ONE SIDE OF THE POLE

Pole typically placed 3' for Narrow Profile from R.O.W or Property Line (PL).

Pole typically Placed 4' for 8' X-arms or Equipment (such as Xfmrs) from R.O.W or Property Line (PL).



## 12. REVISION HISTORY

Revision	Date	Revision by	Comments
1.2	8/23/2021	J. Contreras	Updated 15' radius clearance (per DCM updates)
1.1	9/29/2020	J. Contreras	Removed website links from Cover Page
1.0	7/14/2020	J. Contreras	New Document